Remarks

In an office action dated 19 August 2005, the Examiner requires election of a single disclosed species if a generic claim is not held as allowable in pending claims 1-39. The Examiner states that there is no generic claim in the application. In response to the office action, Applicants elect to prosecute claims 23-36, which read upon the embodiment of the invention disclosed in Figure 10 with Figure 11. Applicants also respectfully traverse the restriction requirement and that the embodiments shown in figures 10, 11 and figure 10,12 are distinct species.

The Examiner asserts that the there is no generic claim covering all embodiments of this invention as required by 37 CFR 1.141. Applicants assert that claims 1 and 23 are generic claims that encompass all embodiments disclosed in the application. This application includes two independent claims 1 and 23. Both claims 1 and 23 are generic claims of an Automatic Power Control of a Semiconductor Optical Amplifier (SOA). Conventional APC system comprise an optical power detector arranged to detect the power of the SOA, with an APC loop using the detected output power as feedback signal to provide APC. As explained in page 1 of the specification, Amplified Spontaneous Emission (ASE) occurring in the active material of the SOA increases the detected output of the power above the power of the amplified signal, which pushes the APC out of regulation. The present invention is concerned with how to compensate for the ASE in the detected output power. In particular, the present invention is based upon an appreciation that the level of Ase can only be characterized accurately of at least two variables. The embodiments of Figures 6, 8, and 10 are based on this appreciation as described below.

The embodiment of Figure 6 employs an APC loop having an analog feedback loop 30 feeding back both the drive current measure by current detector 29 and the

detected output power. This embodiment allows ASE to be compensated accurately because two variables, the measured drive current and the detected power output, are both used in the feedback.

The embodiment of Figure 8 employs an APC loop employing a digital controller in the feedback loop, which receives and feeds back both the detected drive current and the detected output power. This embodiment therefore uses two variables in the same manner as the embodiment shown in Figure 6 using a digital controller as opposed to analog feedback.

The embodiment of Figure 10 employs an APC loop, which has a full digital implementation. This embodiment differs from the embodiments in Figures 6 and 8 in that the embodiment is based on an appreciation that the level of the ASE may be estimated in the digital controller 121 from the detected output power as a first variable and the desired level of the amplified signal as a second variable.

Claims 1 and 23 are generic to all three of these embodiments. Claim 1 defines the invention in terms of an APC loop being arrange to use both a detected output power of the SOA and the derived measure of the drive current. Thus, claim 1 is generic to the embodiments shown in Figures 6 and 8. However, claim 1 does not cover the embodiment of claim 10.

Claim 23 defines the invention in terms of the APC loop using the detected output power of the SOA and being arranged to compensate for an estimated level of ASE based on at least two variables. Thus, claim 23 is generic to each of the embodiments of Figures 6,8, and 10. With regards to the embodiments of Figures 6 and 8 the at least two variable are the detected output power and the measure drive

current. With regards to the embodiment shown in Figure 10, the at least two variable are detected output power and the desired level of the amplified signal.

The Examiners also differentiates between the embodiments Figures 10, 11 and 10,12. However, Figures 11 and 12 merely show two different algorithms implemented in controller 121. Thus, Applicants assert that there is no distinction between the two embodiments as is explicitly stated on page 22, line 5-7. Since figures 11 and 12 simply illustrative alternative control algorithms, it is not appropriate to distinguish between the two embodiments. Thus, Applicants do not believe figures 11 and 12 describe separate embodiments.

Figure 13 is merely, an exemplary embodiment of a circuit that uses an APC loop in accordance with this invention and may use any APC loop described in figures 6, 8, and 10.

For the above reasons, Applicants respectfully request that the restriction requirement be removed and claims 1-39 remain in the application.

If the examiner has any questions regarding this application or this response, the Examiner is invited to telephone the undersigned at 775-586-9500.

Respectfully submitted,
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